

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-9 are presently active in this case, Claims 1, 8 and 9 amended by way of the present amendment.

In the outstanding Official Action, Claims 1-3 and 6-9 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. 2004/0028359 A1 to Tirloni et al.; Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tirloni et al.; Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Tirloni et al. in view of U.S. Patent No. 6,862,391 to Hirano et al.

Turning now to the merits, Applicants' invention is directed to an optical fiber for use as a transmission line in an optical communication system. As disclosed in the background section of Applicant's specification, if a zero dispersion wavelength of a transmission line fiber is between the signal wavelength and a pumping light wavelength, four wave mixing occurs near the signal wavelength which steals Raman gain from the signal light itself. Thus, the zero dispersion wavelength is preferably less than the pumping wavelength so that most of the Raman gain is dedicated to the signal thereby allowing lower pumping power. Further, dense wavelength division multiplexing systems (DWDM) use signal light from 1530 nanometers to 1625 nanometers. As Raman pumping light is about 100 nanometers less than signal light, the present inventors recognized that there is a need for a transmission fiber having a zero dispersion wavelength less than 1430 nanometers. Applicants have now amended independent claims 1, 8 and 9 to clarify this feature of the invention. Specifically, Applicants' independent claims 1, 8 and 9 recite an optical fiber that has, among other things, a zero-dispersion wavelength of not more than 1430 nanometers.

In contrast, the cited reference to Tirloni et al. discloses an optical transmission fiber that allows the transmission of a DWDM optical signal across a wide band without significant degradation from non-linear effects, while also permitting Raman amplification within the fiber.¹ More specifically, Tirloni et al. explains that an optical fiber link having a first non-zero dispersion optical fiber of a high effective area, coupled directly upstream from a second optical fiber having a low effective area non-dispersion, and having low absolute value slope enables efficient Raman amplification across the down stream optical fiber.² Thus, Tirloni et al. is not at all concerned with the problems of four wave mixing caused by a transmission fiber having zero dispersion between a signal wavelength and a pumping wavelength. For this reason, Tirloni et al. does not disclose an optical fiber having a zero dispersion wavelength of not more than 1430 nanometers as now required by Applicants' Claims 1, 8 and 9. On the contrary, Tirloni et al. discloses that an absolute value of dispersion along the whole transmission band is above 1 ps/nm/km over the entire transmission band. In fact, the only mention of zero dispersion in Tirloni et al. is a zero dispersion wavelength equal to 1450 nanometers.³

Finally, Applicants note that Tirloni et al. also does not explicitly disclose a positive small dispersion of 0.1 to 4 ps/nm/km at a wavelength of 1450 nanometers as also required by Applicants' Claims 1, 8, and 9. This may provide an additional basis for patentability of these claims.

Therefore, Applicants' independent 1, 8 and 9 patentably define over the cited references. As Claims 2-7 depend from Claim 1, these claims also patentably define over the cited references.

¹ See Tirloni et al. at paragraph 1.

² See Tirloni et al. at paragraph 32.

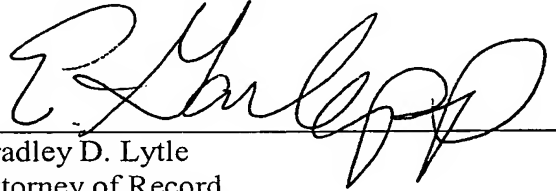
³ See Tirloni et al. at 109.

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Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application. The present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested. ⁴

Respectfully submitted,

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⁴ See Tirloni et al. at paragraph 109.